MASS. GC7.2: En29

UMASS/AMHERST
312066 0374 6984 5

Science Resource Office
Massachusetts General Court
Room 312
State House, Boston, Ma 02133
(617) 722-1236

"Enforcing The Transparent Window Law"

Eric P. Hansen

April 17, 1985

Science Resource Office

GOVERNMENT DOCUMENTS
COLLECTION
NOV 12 1985
University of Massachusetts
Depository Copy

Since January 1, 1985, state law chapter 90, section 9D has required automobile windshields and windows to be transparent. This means automobile windows, in Massachusetts, must let at least 65% of light - shone at 550 nanometers (5,500 angstroms) - pass through.[1] If they allow less, there could be a $250 fine; and, upon a third conviction, a 90 day suspended license.

The law is clear enough; but enforcing it is a problem. In fact, Sergeant Mann of the State Police Selective Enforcement Bureau thinks the law is impossible to enforce. He knows of no police department in Massachusetts currently using a light meter to measure window transparency. And, because there are no measurements taken, any court case involving the law will probably be dismissed. (There have been no cases to date.) A person we spoke with at the Registry of Motor Vehicles, Law Enforcement Division, agreed the law is difficult to enforce saying window transparency cannot be tested in the field, it should be tested in a laboratory.

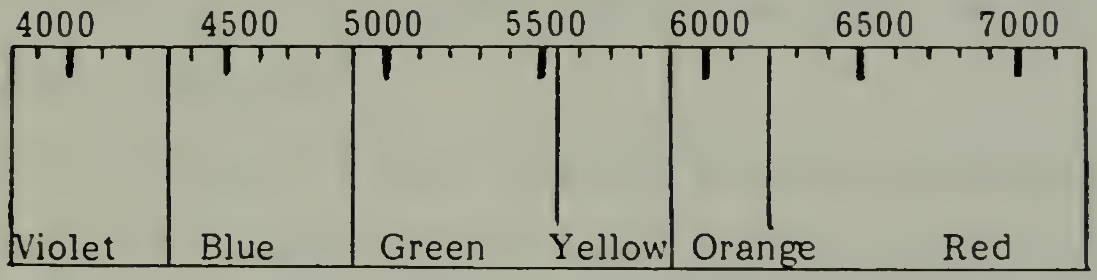
To enforce the law, as it reads now, requires some means of knowing how much light is passing through the window. Some suggested means include comparing small samples of tint, with known transmission factors, to tinted automobile windows or, labeling the tint on windows with the material's transmission factor. As the Registry employee pointed out, the problem with the latter suggestion is that sheets of tint labeled with a legal transmission factor (65% or above) could be placed over tint with an illegal transmission factor (below 65%).

---

[1] Tinted automobile windows installed by the original manufacturer of the car, under Federal Regulation title 49, section 571.205, already have a luminous transmittance of not less than 70% of light at normal incidence, not less than 60% for bullet - resisting windows.

The best idea, according to Professor Ezekeil of the MIT Aeronautics and Astronautics Laboratory, is to test window transparency with a light source and a light detector. The light should shine at a 550 nanometer (5,500 angstrom) wavelength, as specified in the law. At this wavelength, light will be yellow-green-as shown in the following figure.

Wavelength - angstroms



Electromagnetic Spectrum for Visible Light

Source: Mark's Standard Handbook For Mechanical Engineers, 7th ed., 1967

By using a narrow beam of light-the diameter of a pencil - a less sensitive and less expensive light detector can be used. The broad light detectors used in photography cost as much as $500 each. Professor Ezekiel said narrow light sources are used in the fiber optics trade and could probably be purchased there. (Massachusetts manufacturers of fiber optics are listed in the appendix.)

Light detectors, Professor Ezekeil explained, are photoelectric. They receive light and convert the energy into an electrical current which is then measured and given a readout. A ratio of two measurements, one of direct light and one of light shone through the tinted window, determines the percentage of light passing through the window.

A 5% margin of error should be allowed for these detectors.

These instruments, Professor Ezekeil assured us, are simple and could be mass produced at a cost of about $100. They could either be used in the field by police officers or at vehicle inspection stations. If the inspection stations had them, then tinted automobile windows could be tested when a vehicle is inspected yearly.

Some have suggested changing the law so that no measurements of light are further needed. For example, rear and rear side windows could be tinted any shade, no matter how dark, while front windows and windshields must remain clear. Or, tint could be outlawed on all windows altogether.

If the law is not amended, it is clear something is needed to make the law enforceable, since, chapter 90, section 9D requires specific measurements, measuring instruments would help enforce the law as written.

Appendix

Fiber Optics Industry In Massachusetts

Auburn:	KDK Fiber Optics Inc. 19-T Midstate Dr. Auburn, MA 01501	617-832-9229
Beverly:	Rehlander Associates, Inc. 118 A Bridge St. Beverly, MA 01915	617-922-5961
Charlton City:	Techman International Corp., Inc. Techman Trade Center Dept. TR, State Hwy. 20 Charlton City, MA 01508	617-248-3211
Harvard:	Tensitron, Inc. 10 Depot Rd. Harvard, MA 01451	617-456-3511
Northboro:	Fiber Optic Fabrications Inc. 56-T Hudson St. Northboro, MA 01532	617-393-3753
	Mekontrol Inc. 56-T Hudson St. Northboro, MA 01532	617-393-2451
Southbridge:	Applied Fiber Optics, Inc. Industrial Fiber Optics Division 4 E. Main St. Southbridge, Ma 01550	617-765-9121
	Incom, Inc. Drawer St. 203 Chapin St. Southbridge, MA 01550	617-765-9151
	Reichert Fiber Optics Warner-Lambert Technologies Inc. 122 Charlton St. Southbridge, MA 01550	617-765-9744
Sturbridge:	Galileo Electro Optics Corp. Galileo Industrial Park-T Sturbridge, MA 01518	617-347-9191
	Spectran Corp. 50-T Hall Rd. Sturbridge, MA 01566	617-347-2261

Wakefield:	Fiber Optic Engineering 134-T Water St. Wakefield, MA 01880	617-245-1047
West Medford:	Mass-Flex Research, Inc. 18 Canal St. West Medford, MA 02155	617-391-3640
Westfield:	Instrument Technology, Inc. Mainline Dr. Westfield, MA 01086	413-562-3606
Woburn:	Dolan-Jenner Industries, Inc. A Unit Of Barry Wright Corp. P.O. Box 1020T Woburn, MA 01801	617-935-7444

Source: Thomas Register of American Manufacturers and Thomas Register Catalog File: Products and Services, 1985, vol.4 p. 5947

Sources Cited

American National Standards Institute, Inc., American National Standard for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways - Safety Code, ANSI Z26.1-1983.

Baumeister, Theodore, ed. Marks' Handbook For Mechanical Engineers, 7th ed. McGraw-Hill Inc., 1967 "Luminosity Factor Chart."

Dogigli, Johannes. The Magic of Rays

Ezekiel, Professor, Aeronautics and Astronautics Laboratory, Massachusetts Institute of Technology. Cambridge, MA: February 1985, Telephone interview.

Mann, Sergeant, Selective Enforcement Bureau, Massachusetts State Police. Concord, MA: February 1985, Telephone interview.

National Highway Traffic Safety Admin., Dept. of Transportation, Federal Motor Vehicle Safety Standard No. 205; Glazing Materials, Code of Federal; Regulations Title 49 part 571.

Pave, Marvin. "Law on car windshield visibility brings problems with enforcement." The Boston Globe, 10 February 1985, p. 29.

Registry of Motor Vehicles, Law Enforcement Division, spokesperson. Boston, MA: February 1985, Telephone interview.

Roth, Deborah, Lighting Designer, Robinson Roth and Assoc. Inc., Boston, MA: February 1985, Telephone interview.

Thomas Publishing Co., New York, Thomas Register of American Manufacturers and Thomas Register Catalog File: Products and Services, 75th ed., vol. 4 p. 5947.

"Windshields and windows obscured by nontransparent materials, signs, stickers, etc.; penalties." Chapter 90, section 9D.